Commentary for AB 32 Scoping Plan, Economic Analysis Technical Stakeholder Working Group meeting of June 3, 2008, on the subject of cost-effectiveness[1]

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The presentations and discussion of "cost-effectiveness" in the June 3 meeting use the term as a synonym for "cost"; and the term "cost-effective" (in the adjective sense) is used synonymously with "least-cost". The proposed cost-effectiveness methodologies are directed toward achieving the AB 32 statewide emission cap in 2020 at least cost, in accordance with the mandated statewide greenhouse gas emissions limit and the cost minimization requirement of Sec. 38562(b)(1)[2]. However, the usage of the term "cost-effective" as a synonym for "least-cost" is inconsistent with its use in Sec. 38560[3], which requires that the AB 32 regulations achieve "the maximum technologically feasible and cost-effective greenhouse gas emission reductions …". In this context cost-effectiveness is a threshold constraint subject to which emission reductions (not cost reductions) are to be maximized.

The classical economic definition of "cost-effectiveness", which relates to cost minimization subject to a fixed emission constraint, is inconsistent with the term's use in AB 32 (emissions minimization subject to feasibility and cost-effectiveness constraints). The presentations at the June 3 meeting did not recognize this distinction and did not recognize the statutory requirement for maximum emission reductions. Indeed, neither ARB nor any of the advisory groups or institutional stakeholders involved in the AB 32 process appears to recognize the maximum reduction mandate of Sec. 38560 as a statutory requirement distinct from and additional to the cap.

The Market Advisory Committee's June, 2007 report[4] is representative of the prevailing institutional perspective on Sec. 38560. The report made 30 specific recommendations on the design of a cap-and-trade system, the first of which is the following:

> In 2020, the emissions cap in a California GHG trading program should be set equal to total allowable emissions under the Global Warming Solutions Act minus projected emissions from sources and sectors not covered by the cap-and-trade program.

The implication of this recommendation is that if an uncapped sector such as transportation achieves emission reductions beyond what is required to achieve the statewide limit in 2020, then those additional reductions would not result in further reduction of statewide greenhouse gas emissions. They would be applied to relax the cap stringency, without consideration of whether a more stringent cap would be feasible and

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[1] [http://www.arb.ca.gov/cc/scopingplan/economics-sp/meetings/meetings.htm]

[2] AB 32, Sec. 38562(b)(1): "Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions."

[3] AB 32, Sec. 38560: "The state board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources, subject to the criteria and schedules set forth in this part."

[4] [http://www.climatechange.ca.gov/market_advisory_committee/index.html]

cost-effective. The recommendation implicitly rejects and contravenes the AB 32 maximum reduction mandate.

ARB's position on the maximum reduction mandate was stated in the November 30, 2007 Scoping Plan workshop in response to the following question:

> The Scoping Plan is required to achieve "the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from sources or categories of sources of greenhouse gases by 2020". Does ARB view this requirement as being additional to the 2020 cap requirement, or are the two requirements viewed as being synonymous?

Staff response was that the two requirements are synonymous.[5]

The draft Scoping Plan may give an indication of whether there has been any evolution of ARB's position on the above question; but to the extent that the maximum reduction mandate is synonymous with the cap requirement, cost-effectiveness is irrelevant because the cap is not conditioned on cost-effectiveness. AB 32 is clearly based on the legislature's expectation that the cap would be consistent with any reasonable standard of cost-effectiveness, because the cap is imposed unconditionally.[6] If the cap does not satisfy ARB's cost-effectiveness criterion, then the criterion would be modified to accommodate the cap, not vice-versa.

The legislature also had a clear expectation that emission reductions beyond the cap limit might be achievable by 2020, because AB 32 imposes a requirement, separate from and additional to the cap requirement, that the regulations achieve "the maximum technologically feasible and cost-effective greenhouse gas emission reductions …". Under the premise that the cap is cost-effective or otherwise supersedes cost-effectiveness, the combination of the Sec. 38551(a), 38560, and 38562(b)(1) mandates implies that the regulations should achieve the 2020 cap at least cost, but without consideration of ARB's cost-effectiveness criteria, and that the regulations should additionally incentivize further emission reductions to the extent that such reductions would be feasible and cost-effective. The cost-effectiveness requirement does not imply authority to relax the cap; it only has relevance to the additional objective of maximizing emission reductions.

The maximum reduction mandate raises several questions: (1) How can the emission reduction goal of Sec. 38560 be reconciled with the cost reduction goal of Sec. 38562(b)(1)? (2) What kind of policy instrument would be suitable for implementing Sec. 38560? (3) What benefits might be expected from implementing Sec. 38560?

Regarding the last question, historical experience with the Acid Rain Program can provide some guidance. A recent analysis of the program estimates its annual benefits in 2010 at $122 billion and costs for that year at $3 billion (2000$) – a 40-to-1 benefit/cost

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[5] [http://ssrn.com/abstract=1080608]

[6] AB 32, Sec. 38551(a): "The statewide greenhouse gas emissions limit shall remain in effect unless otherwise amended or repealed."

ratio.[7] The $3 billion projected cost is half the cost estimated by EPA in 1990. Had a price floor at the original price expectation level been employed, then emissions might have been further reduced by perhaps a factor of two, additional benefits on the order of $100 billion might have been gained, and there may have been no need for the Clean Air Interstate Rule, which had to be enacted to 2005 to increase the regulations' stringency. (A price floor could have been implemented as a reservation price in an allowance auction, with auction revenue being disbursed in according to the same proportionate allocation formula that the program uses for free allocation.)

Extrapolating to global GHG regulation, policy instruments such as a price floor could be similarly employed to incentivize feasible and cost-effective emission reductions beyond minimal cap requirements. It would be fairly straightforward to adapt the AB 32 regulations to create such incentives. Under the premise that the cap is feasible and cost-effective based on currently-available information, a price floor could be established at the cap's projected marginal compliance costs. ARB would not need to do any analysis of technological feasibility or market response to determine what level of emission reduction – if any – beyond the cap would be feasible and cost-effective. That determination would be made by the market in response to the price incentive. (The above-quoted MAC recommendation would be compatible with Sec. 38560 if a price floor were implemented.)

Regarding cost minimization, a price floor could increase near-term regulatory costs relative to what would be required to only achieve the cap. From the perspective of classical cap-and-trade theory, this would appear to violate the cost minimization requirement of Sec. 38562(b)(1). However, this perspective overlooks a fundamental difference between AB 32 and the classical theory: In the context of climate stabilization, the lower compliance cost of cap-and-trade without any overcompliance incentives (such as a price floor) does not represent cost savings; it represents deferred costs because emissions will have to eventually be reduced by an order of magnitude below the 1990 level with or without such incentives.[8] Incentives for overcompliance and early action, though more costly in the near term, could result in much greater cost savings after 2020 when emissions will need to be further reduced to sustainable levels. Thus, in view of post-2020 climate stabilization costs, policy instruments such as a price floor would be instrumental in achieving maximum technologically feasible and cost-effective emission reductions pursuant to Sec. 38560 while also incentivizing early action and minimizing long-term costs pursuant to Sec. 38562(b)(1).

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[7] [http://www.epa.gov/airmarkt/cap-trade/docs/benefits.pdf]

[8] "If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO2 will need to be reduced from its current 385 ppm to at most 350 ppm." [quoted from "Target atmospheric CO2: Where should humanity aim?", Hansen et al, http://arxiv.org/abs/0804.1126]